

EXAMINATION

15 September 2006 (am)

Subject ST1 — Health and Care Specialist Technical

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all 8 questions, beginning your answer to each question on a separate sheet.*
6. *Candidates should show calculations where this is appropriate.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

- 1** (a) Describe, with examples, three distinct approaches to the definition of “incapacity” used in income protection policies.
- (b) For each approach give two reasons why the approach is used and give an example of an occupation or group of people for which the approach would be suitable. [7]

- 2** You are an actuary working in the financial projections team within a well-established insurer that writes both long and short-term classes of health insurance. A junior actuarial analyst in your team has identified that lapse rates for the organisation have deteriorated over the last five years.

List the factors by which you would analyse the data in order to investigate this apparent trend. [4]

- 3** A non executive director to the long term insurance company for which you work has proposed that the company should offer income protection insurance with a one-day deferred period; he suggests that this would have a substantial impact on the level of new business. Discuss the potential problems with this strategy. [5]

- 4** An extract of the rates underlying a critical illness table (CIBT06) is shown below:

<i>Age</i>	<i>Incidence rate per 1,000</i>	<i>28 day mortality rate per 1,000</i>	<i>Mortality rate per 1,000</i>	<i>Proportion of deaths from CI</i>
34	1.1	0.10	0.6	0.25
35	1.2	0.11	0.7	0.25
36	1.3	0.12	0.8	0.25
37	1.4	0.13	0.9	0.25

The insurer only sells accelerated critical illness contracts and uses the following basis to calculate premium rates:

Claim assumption: 50% CIBT06 with a 20% selection discount

Interest: 4% p.a.

Expenses and profit: 10% loading

Premiums are payable annually in advance and the sum assured is payable at the end of the policy year of death or critical illness.

- (i) Calculate the annual premium for a policyholder aged 35 next birthday at entry for a sum assured of £50,000 for a policy with a term of one year. [4]

The insurer is considering adding an option to allow a policyholder to effect a new policy at the expiry of the original policy. The new plan will be offered for a term of one year and will be based on the new business premium rates in force at that date. The policyholder does not have to provide any evidence of health on the exercise of this option.

- (ii) Given the above information, estimate the additional annual premium for the proposed option. You should state all of your assumptions. [5]
 - (iii) Estimate the additional annual premium for the option, assuming that 30% of policyholders will exercise the option and that their experience under the option policy will be 70% CIBT06. You should state all of your assumptions. [3]
 - (iv) Discuss which of the two estimates calculated in parts (ii) and (iii) above is the most appropriate cost. [2]
 - (v) Discuss other factors you would consider before introducing this option. [2]
- [Total 16]

- 5**
- (i) Describe the main distribution channels for health and care products. [8]
 - (ii) Indicate, with reasons, for each of the channels whether it is an appropriate form of distribution for each of critical illness, hospital cash and long term care insurance. [4]
- [Total 12]

- 6** Janet and John, who are both in their 20's, were recently married and are meeting an insurance broker to discuss their financial plans. John is self-employed so has no employee benefits. He earns £30,000 p.a. Janet works for a financial institution which has an employee benefit package that includes a short-term sick pay scheme and a Group Income Protection plan. She earns £24,000 p.a.

John is considering the following income protection policy:

Type:	Individual income protection policy
Deferred period:	Three months
Definition of disability:	Unable to follow own occupation
Benefit amount:	£1,000 per month
Benefit term:	Benefit is paid from the end of the deferred period for a maximum of 5 years
Expiry age:	60 th birthday

Janet is currently a member of her employer's benefit package. The benefits are:

Type:	Short-term sick pay plan
Deferred period:	None
Definition of disability:	Unable to follow own occupation
Benefit amount:	100% of salary for 2 months, 75% of salary for the next 4 months
Expiry age:	65 th birthday

Type:	Group income protection policy
Deferred period:	Six months
Definition of disability:	Unable to follow own occupation
Benefit amount:	60% of pre disability salary
Benefit increase:	3% on the anniversary of the income protection benefit becoming payable
Expiry age:	65th birthday

- (i) Describe what medical and financial underwriting would be required for John's income protection plan benefits. [3]
- (ii) Calculate what employee and insurance benefits would be payable if Janet and John were both injured in a road traffic accident and were unable to work for six years. You should ignore the effect of any income tax that might be payable. You should set out your answer showing the benefits paid in each of the years. [7]
- (iii) Janet's twin sister, Joan, is about to join Janet's company. Describe the medical and financial underwriting that would be required for her to join the same income protection and short-term sick pay scheme. [2]
- [Total 12]

7 An overseas company has purchased the assets of a manufacturing company that has been put into liquidation. The company originally employed 10,000 employees. The new owners are intending to restart some of the manufacturing activities two months later and will employ about 2,000 former employees. It is proposed that the health benefit arrangements of the original employer will be provided for the employees. The details are:

PMI scheme:	Members
PMI benefits:	Full coverage for acute conditions Nil excess, non-contributory scheme for employees

It has been agreed that the insurer of the original PMI scheme will be invited to insure the scheme for the remaining employees at the restart on the same basis and price as before.

The insurer is considering their response to this invitation.

- (i) Outline the data that the insurer will require from the company to produce their response. [6]
- (ii) Outline the additional items of information that the insurer will need to collect from internal and other sources. [8]
- (iii) Consider what action might be taken by the insurer if the calculation of the new premium
- (a) produces a lower premium than previously quoted
- (b) produces a higher premium than previously quoted [5]
- [Total 19]

8 You are a marketing actuary working within a reinsurer. Your organisation has segmented the insurance market into the following:

- Segment A Small new entrants to the health and care insurance market.
- Segment B New entrants to health and care insurance that are significant established insurers for other lines of business.
- Segment C Existing health and care insurers whether or not currently reinsured.

- (i) Describe the reasons why insurers may choose to reinsure their business, highlighting where there may be differences between the segments above. You do not need to consider the different types of reinsurance arrangement as part of your answer. [10]

Within segment A, a small insurer is considering entering the private medical insurance market and has asked you to present a potential surplus reinsurance arrangement to them for their consideration.

- (ii) Describe the key features of surplus reinsurance and whether you believe this is an appropriate form of reinsurance in this context. [3]
- (iii) Describe the other forms of reinsurance arrangement available, giving an indication of their appropriateness in this situation. [12]

[Total 25]

END OF PAPER